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Owner's Manual
Talon LC Hydraulic
Cargo Hook Kit

on the

Airbus Helicopters AS350

Part Number 200-281-01, 200-281-02

Owner's Manual Number 120-106-01
Revision 7
05/14/14

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RECORD OF REVISIONS

Revision	*Date*	*Page(s)*	*Reason for Revision*
0	06/16/06	All	Original issue.
1	01/14/08	2-10, 2-11	Added "Remove rubber bumpers from swing assembly" instruction and updated Figure 2.2.4. Removed color labels from wiring diagram Figure 2.2.3.
2	02/10/09	5-3 & 5-6	Corrected P/N 232-240-00 to 232-241-00 on 232-222-00 illustrated parts list. Updated illustrated parts list to show P/N 232-240-01 used on P/N 232-241-00.
3	09/29/09	2-3, 2-7, 3-1	Updated Figure 2.1.3 to show complete collective, added note on page 2-7 to allow alternative routing, clarified Figure 3.1.
4	08/03/10	Section 1 through 4	Replaced P/N 212-014-00 with 212-014-01 and updated hydraulic fluid filling instructions to use new kit. Updated warnings, cautions and notes section to safety label section. Updated safety label format throughout document.
5	12/19/11	5-7	Replaced Cup Seal (P/N 556-038-00) with Quad Ring (P/N 556-097-00) inside Slave Cylinder Assembly.
6	10/11/13	5-6	Replaced Slave Cylinder Plumbing P/N 232-240-01 with P/N 232-240-02.
7	05/14/14	2-2, 3-2, 3-3	Updated cargo hook rigging section, changed recommended minimum bend radii of hose to 1.5 inches.

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Section 1
General Information
Introduction

The 200-281-01 and 200-281-02 Cargo Hook Kits are approved as a replacement for the following cargo hook on Airbus Helicopters AS350 Series, equipped with a B3 type swing system. The B3 type swing systems are installed on AS350B3 models and can be retrofitted to earlier models via Airbus Helicopters Service Bulletin 2500.62.

P/N	Manufacturer
AS 21-5-7	Siren

The 200-281-02 Cargo Hook Kit is approved for installation on the AS350B3 model. The 200-281-01 is approved for installation on the AS350B2 and earlier models.

Safety Labels

The following definitions apply to Safety Labels used in this manual.

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Draws the reader's attention to important or unusual information not directly related to safety.

Used to address practices not related to personal injury.

Specifications

Table 1-1 P/N 528-028-00 Cargo Hook Specifications

Design load	3,500 lbs. (1,580 kg.)
Design ultimate strength	13,125 lbs. (5,952 kg.)
Electrical release capacity	8,750 lbs. (3,970 kg.)
Mechanical release capacity	8,750 lbs. (3,970 kg.)
Force required for mechanical release at 3,500 lb.	12 lbs max. @ Master Cylinder
Electrical requirements	22-32 VDC 6.9 – 10 amps
Minimum release load	0 pounds
Unit weight	3.0 pounds (1.35 kg.)
Mating electrical connector	PC06P8-2S

Load capacities given are for the equipment described only. Loading limits for your particular helicopter model still apply. Consult your flight manual.

Inspection

Inspect the cargo hook for evidence of damage, corrosion and security of lock wire and fasteners. If damage is evident, do not use the unit until it has been repaired.

Bill of Materials

The following items are included with the Cargo Hook Kit, if shortages are found contact the company from whom the system was purchased.

Table 1-2 Bill of Materials

Part Number	Description	Quantity 200-281-01	Quantity 200-281-02
120-106-01	Cargo Hook Kit Owner's Manual	1	1
121-014-01	Flight Manual Supplement	1	1
122-015-00	Cargo Hook Service Manual	1	1
123-013-01	ICA Maintenance Manual	1	1
215-169-00	AS350 Light Indicator Placard	2	2
232-222-00	Cargo Hook/Link Assembly	1	1
232-165-00	Master Cylinder Assembly	1	-
232-165-01	Master Cylinder Assembly	-	1
235-135-00	Disconnect Bracket	1	1
291-105-00	Friction Handle	-	1
510-453-00	Bolt	1	1
510-042-00	Washer	1	1
510-102-00	Nut	1	1
512-005-00	Adel Clamp	1	1
500-065-00	Grommet Edging	1	1
505-014-00	Grommet	1	1
590-013-00	Spiral Wrap	48"	48"
450-001-00	1/8" Heat Shrink Tubing, 1/2" Lg.	2	2
450-120-00	¼" dia. Heat Shrink Tubing, 4" Lg.	1	1
450-113-00	½" dia. Heat Shrink Tubing, 3" Lg.	1	1
510-486-00	CherryMax Rivet	3	3

Theory of Operation

The primary elements of the Cargo Hook are the load beam, the internal mechanism, and a DC solenoid. The load beam supports the load and is latched through the internal mechanism. The DC solenoid and an external manual release cable provide the means for unlatching the load beam.

A load is attached to the load beam by passing the cargo sling ring into the throat of the load beam and pushing the ring against the upper portion of the load beam throat, which will initiate the hook to close. In the closed position, a latch engages the load beam and latches it in this position.

To release the load, the latch is disengaged from the load beam. With the latch disengaged, the weight of the load causes the load beam to swing to its open position, and the cargo sling slides off the load beam. The load beam then remains in the open position awaiting the next load.

A load release can be initiated by three different methods. Normal release is achieved by pilot actuation of the push-button switch in the cockpit. When the push-button switch is pressed, it energizes the DC solenoid in the Cargo Hook, and the solenoid opens the latch in the internal mechanism. In an emergency, release can be achieved by operating the hydraulic release system. The hydraulic release system is operated via a lever in the cockpit and actuates the internal mechanism of the Cargo Hook to unlatch the load beam. The load can also be released by the actuation of a lever located on the side of the Cargo Hook.

Section 2
Installation Instructions

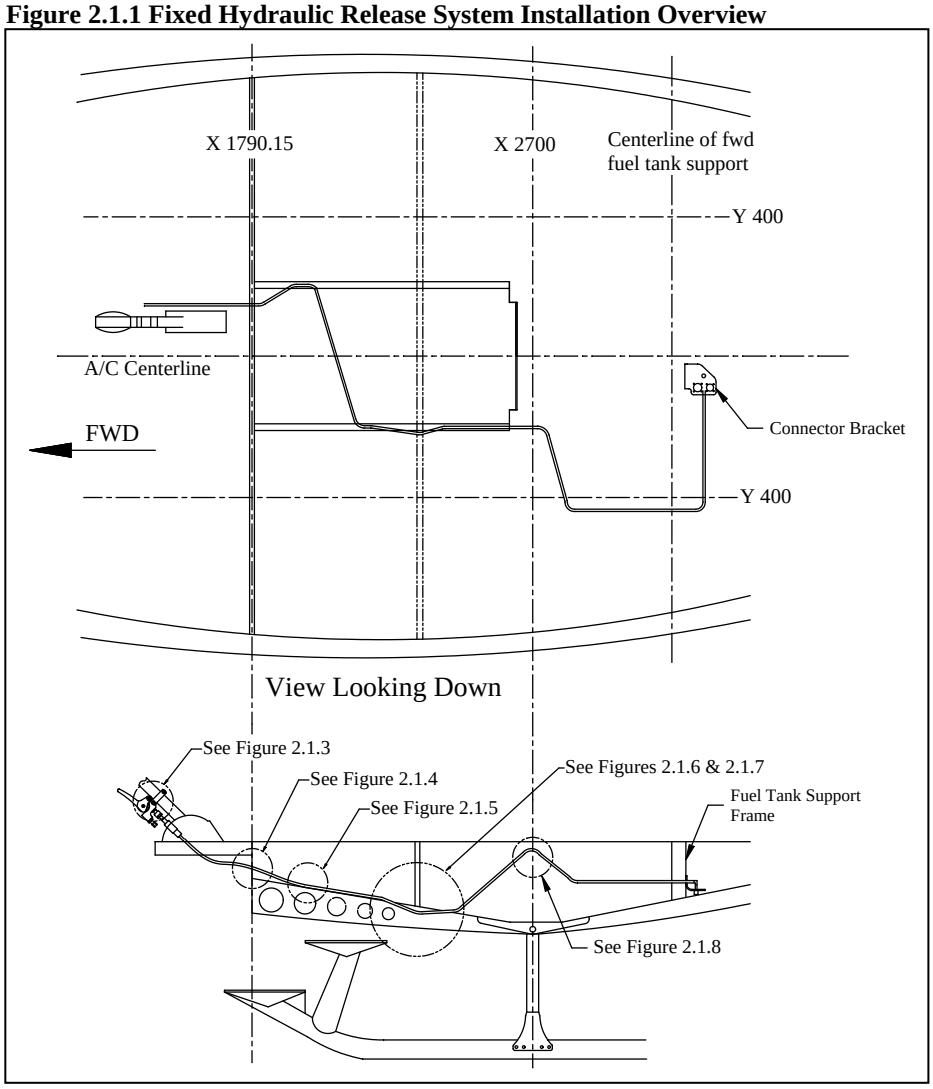
These procedures are provided for the benefit of experienced aircraft maintenance facilities capable of carrying out the procedures. They must not be attempted by those lacking the necessary expertise.

2.1 Hydraulic Release System Installation

Remove the swing suspension, external electrical release harness and the external section of the manual release cable from the helicopter. Remove the lower cowlings as necessary to access and remove the internal section of the manual release cable system.

The hydraulic release system installation consists of a fixed section and a removable section. The fixed section is routed from the release lever at the collective, underneath the cabin floor, and aft to meet up with the existing cargo hook electrical release harness (as shown in Figure 2.1.1). Figure 2.1.1 is an overview of the hose routing and the figures following detail the support installations at various points.

Figure 2.1.1 Fixed Hydraulic Release System Installation Overview

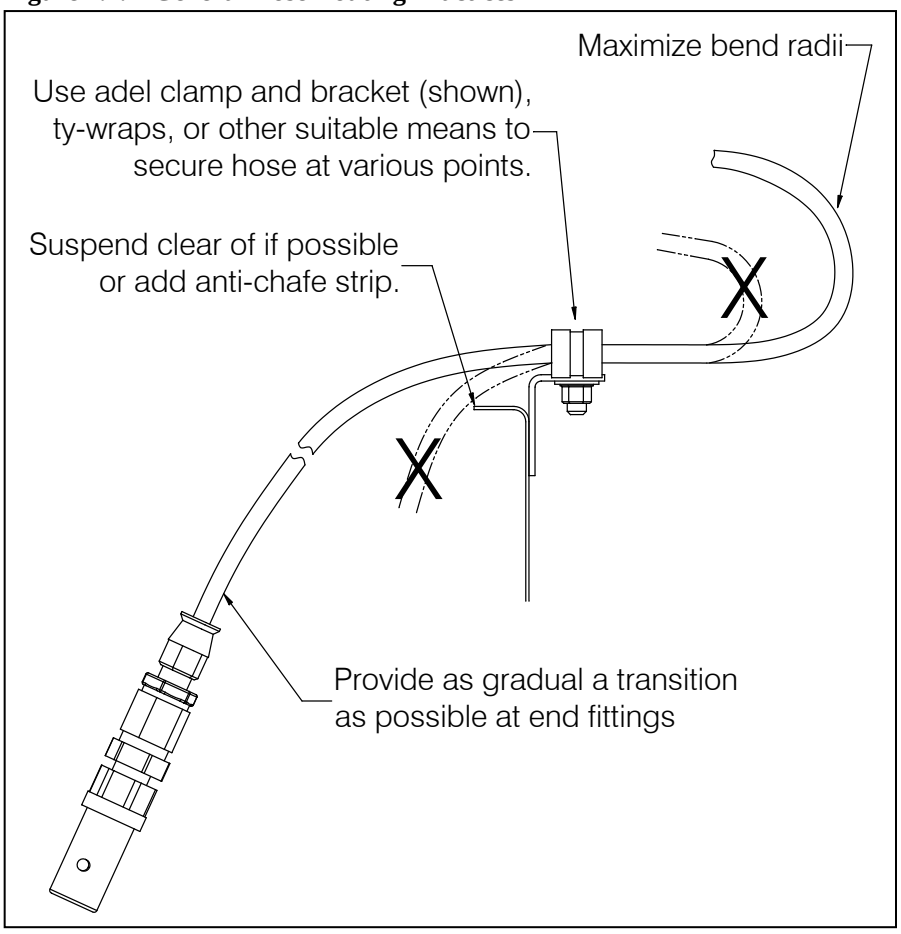


2.1 Hydraulic Release System Installation **continued**

Observe the following precautions (ref. Figure 2.1.2) when routing the hydraulic hose.

- Use care to avoid kinking the hose.
- Recommended minimum hose bend radii is 1.5 inches. Avoid abrupt change in direction of the hose just outside the end fittings. Provide gradual transitions where possible.
- Verify that the hose routing is clear of and cannot be deflected into chafe points.

Figure 2.1.2 General Hose Routing Practices

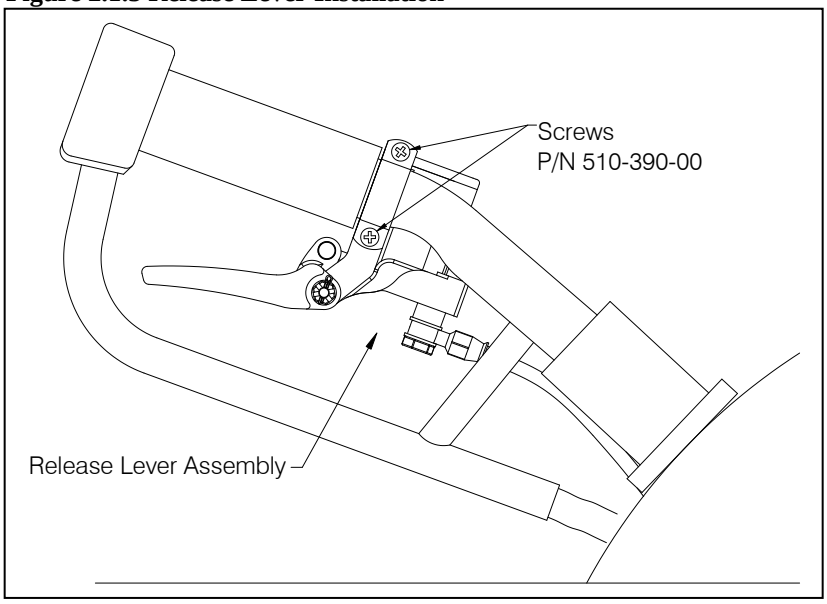

Maximize bend radii
Use adel clamp and bracket (shown), ty-wraps, or other suitable means to secure hose at various points.
Suspend clear of if possible or add anti-chafe strip.
Provide as gradual a transition as possible at end fittings

2.1 Hydraulic Release System Installation continued

The hydraulic release system is supplied dry. It is recommended that the system be filled and bled on the bench before installing on the helicopter. Refer to section 2.7 for filling and bleeding instructions.

- ❑ Mount the Release Lever Assembly (P/N 232-165-00) to the collective stick with the Clamp Half (P/N 290-753-00) and two screws (P/N 510-390-00) provided pre-assembled on the assembly, as illustrated below.

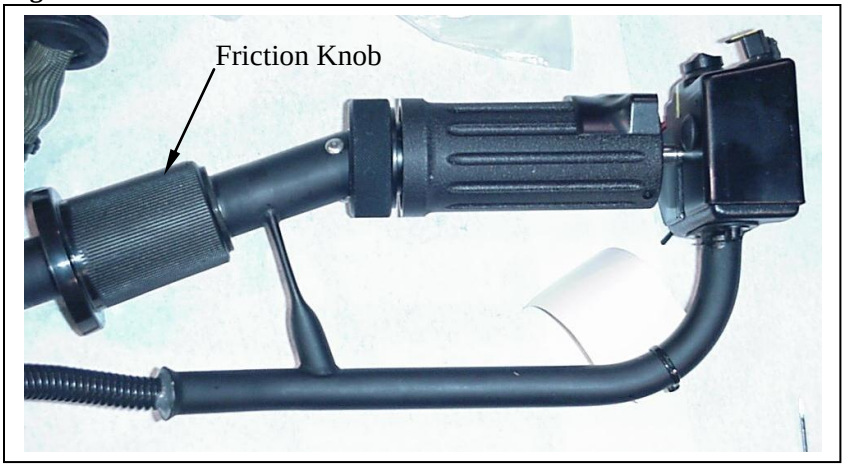
Figure 2.1.3 Release Lever Installation



NOTICE

If installing kit P/N 200-281-02 (for the AS350B3 model) a shorter friction adjustment knob for the collective is required because of interference with the master cylinder assembly reservoir. This item is supplied as P/N 291-105-00. See below for installation instructions.

Figure 2.1.4 B3 Collective



2.1 Hydraulic Release System Installation continued

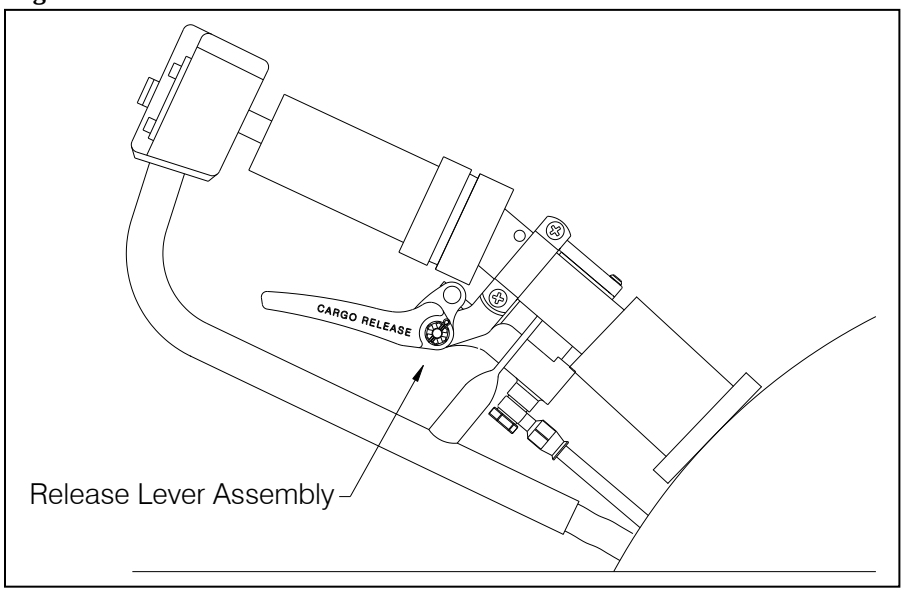
- Remove the collective to the extent necessary to remove the friction knob. Refer to Airbus Helicopters maintenance manual for removal and re-installation instructions.
- Replace the OEM friction knob with the friction knob P/N 291-105-00 provided.
- Re-install collective per Airbus Helicopters maintenance manual instructions.
- Mount the Release Lever Assembly (P/N 232-165-01) to the collective stick with the Clamp Half (P/N 290-753-00) and two screws (P/N 510-390-00) provided pre-assembled on the assembly, as illustrated below.

NOTICE

Locate the Release Lever Assembly on the collective shaft as close as possible to the throttle twist grip (as shown in Figure 2.1.5).

- Adjust the Friction Knob to its outermost position and verify that there is clearance with the reservoir on the release lever assembly.

Figure 2.1.5 AS350B3 Release Lever Installation



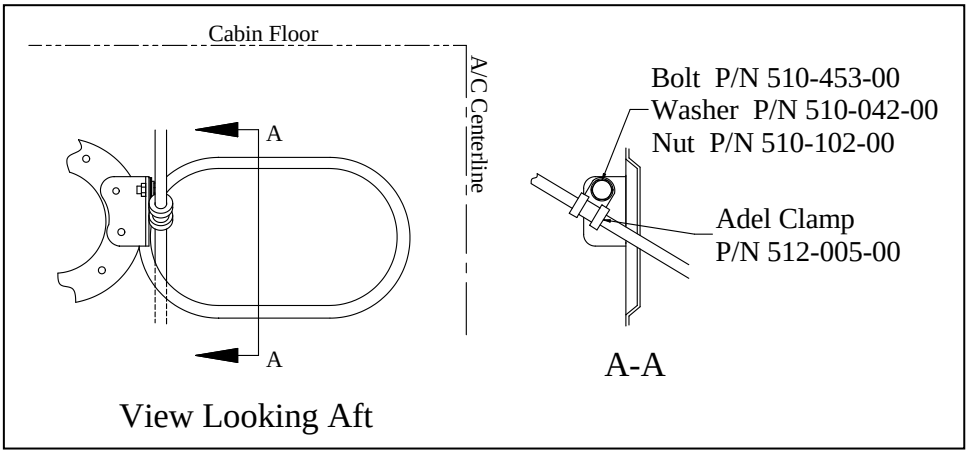
NOTICE

The lever position is to be adjusted, if necessary, at installation check out, after the system is filled and bled.

2.1 Hydraulic Release System Installation continued

- Route the hose to underneath the cabin floor through the existing slot (through which the manual release cable was routed through) to the right of the base of the collective.
- Underneath the floor, route the hydraulic hose through an existing hole in the frame immediately aft of the collective. Secure the hose at this point with an adel clamp (P/N 512-005-00). Fasten the adel clamp to the existing bracket (Airbus Helicopters P/N 350A86-0020-33) with hardware as illustrated below.

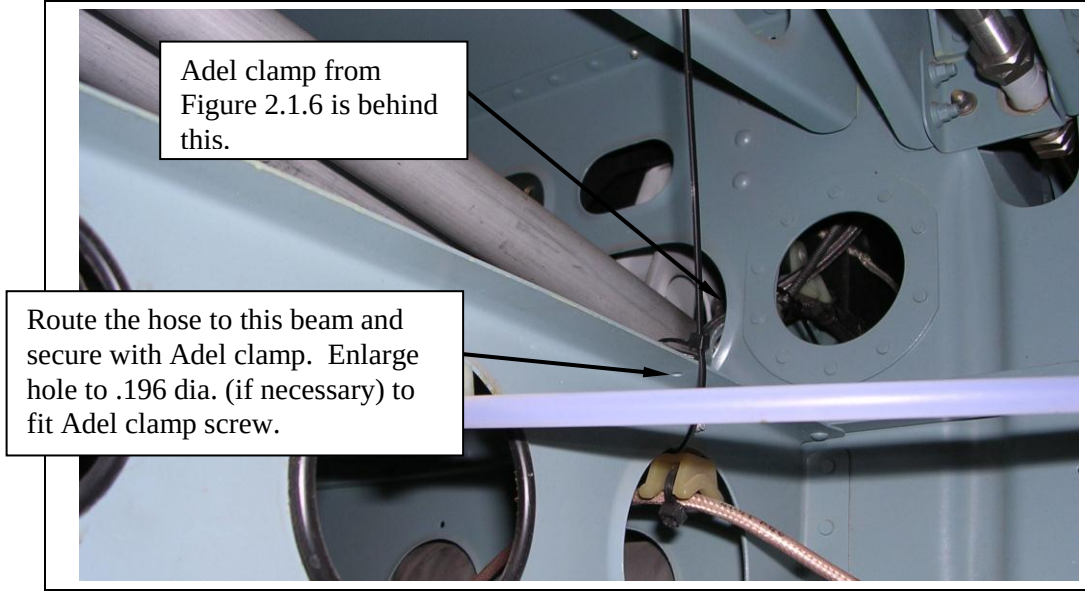
Figure 2.1.6 Hose Routing Through Frame



2.1 Hydraulic Release System Installation continued

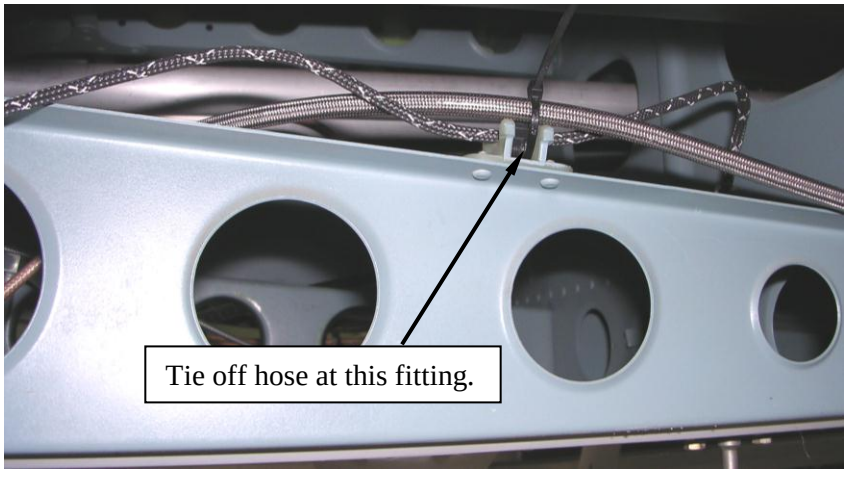
- Aft of the frame, route the hose along the top of the structural member (shown below) and secure with adel clamp (P/N 512-005-00) at location shown.

Figure 2.1.7 Adel Clamp Installation


Adel clamp from Figure 2.1.6 is behind this.
Route the hose to this beam and secure with Adel clamp. Enlarge hole to .196 dia. (if necessary) to fit Adel clamp screw.

- Aft of the adel clamp installed above, route the hose inboard and aft across the airframe centerline to the identical structural member on the left side of the airframe. Secure hose to fitting on top of structural member with ty-wrap as shown below. Ensure the hose is secured so that it does not interfere with the control rods.

Figure 2.1.7 Hydraulic Hose Routing



2.1 Hydraulic Release System Installation continued

- Route the hose under the airframe support (as shown below) and secure the hose to the fitting on top of the structural member aft of the airframe support. Install grommet edging (P/N 500-065-00) as necessary to protect hydraulic hose from chafing.

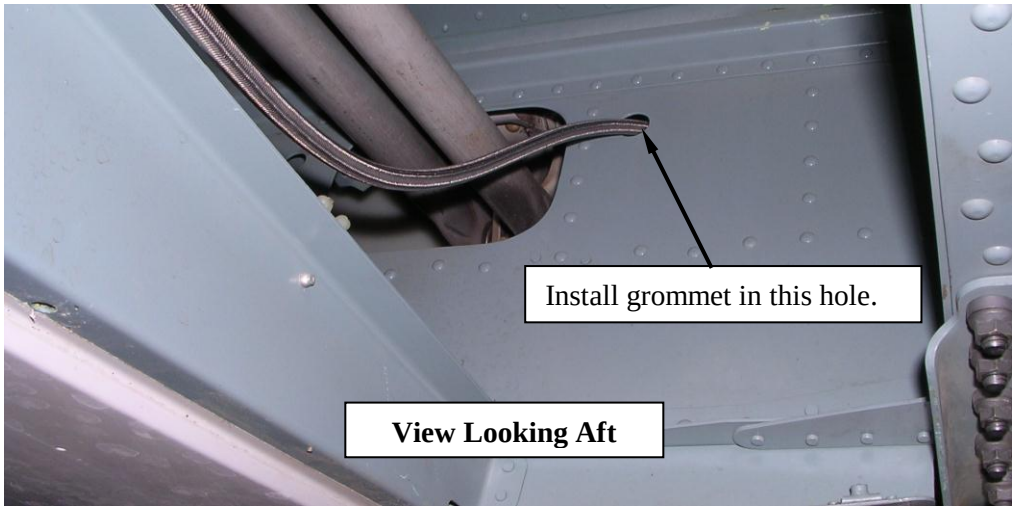
Figure 2.1.8 Routing under Airframe

- Route the hose up through the rear cabin bulkhead as shown in Figure 2.1.9. Split and install grommet (P/N 505-014-00) in hole after hose is routed through.

NOTICE

If this hole is not available, route the hose outboard to the existing electrical harness and route with electrical harness to the connector bracket. Space hydraulic hose off of electrical harness or apply protective wrap over hose to prevent it from rubbing on wires.

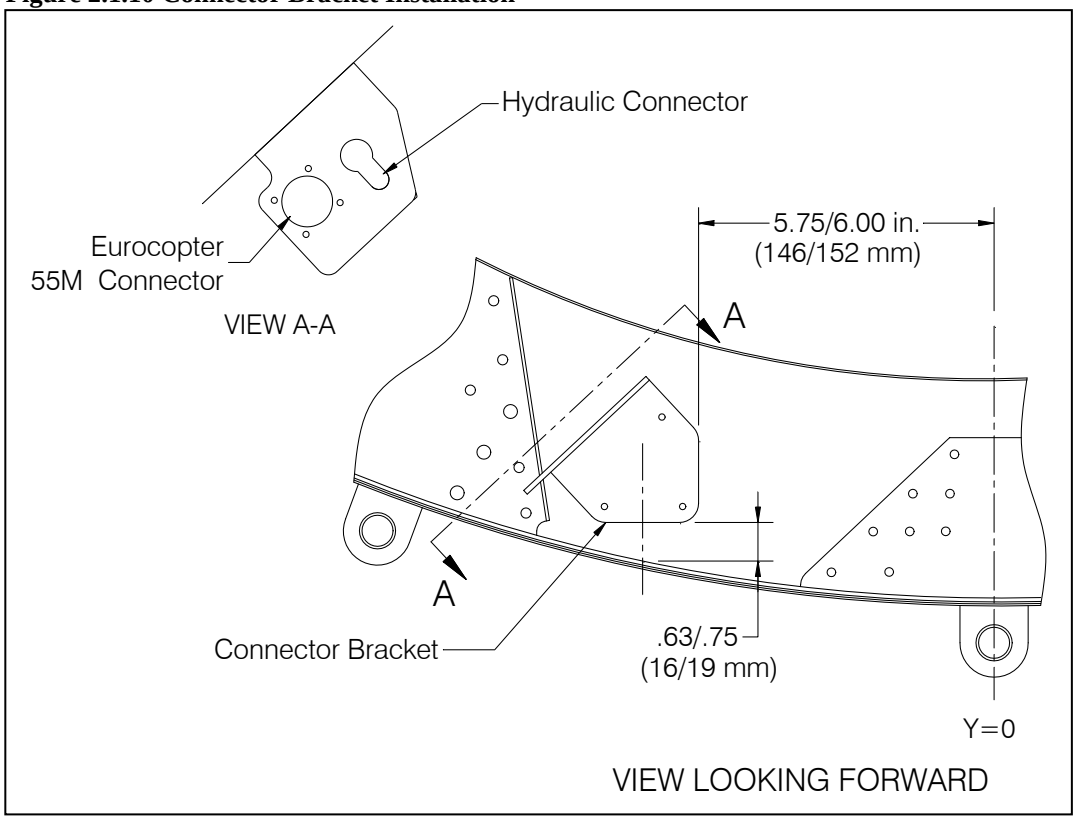
Figure 2.1.9 Hose Routing through Rear Cabin Bulkhead



2.1 Hydraulic Release System Installation continued

- Aft of the rear cabin bulkhead pick up existing electrical harness and secure hydraulic hose to it. Prevent the hose from rubbing on the wires by spacing it off or applying protective wrap. The hose will route outboard of Y400 and follow the electrical release harness to the connector bracket.
- Temporarily remove the Airbus Helicopters connector 55M from the existing connector bracket.
- Remove existing connector bracket by drilling out the three rivets.
- Locate the provided connector bracket as shown below and drill out pilot holes in the supplied connector bracket to 0.129/0.132" (3.2/3.4 mm) diameter and drill fuel tank support to match.
- Secure Connector Bracket to fuel tank support with three rivets (P/N 510-486-00).
- Insert the hydraulic hose end fitting through the hole and slide it aft to the end of the slot and tighten jam nut.

Figure 2.1.10 Connector Bracket Installation

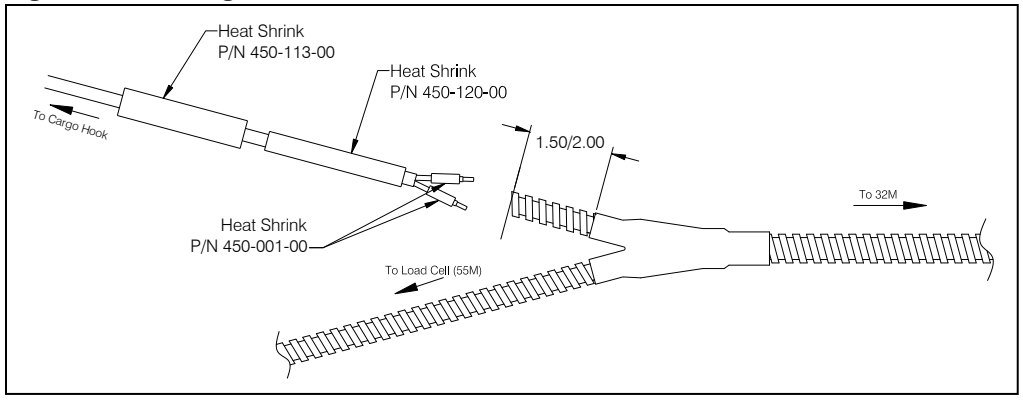


2.2 Cargo Hook Installation

The cargo hook assembly includes an electrical pigtail which must be spliced into the Airbus Helicopters Y harness. Splice per the following instructions.

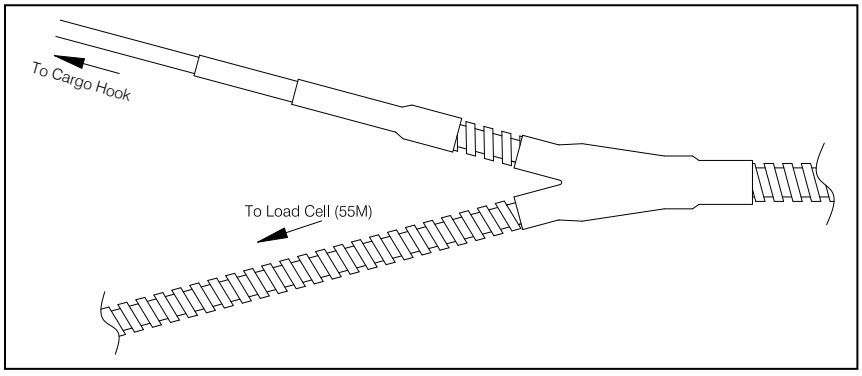
- Cut the leg of Y harness that goes to the cargo hook off within 1.50/2.00" from the Y junction.
- Cut the electrical pigtail from the cargo hook to a length which provides for optimal routing when spliced with the Y harness.
- Strip the outer heat shrink, wire jacket and shield back 1". Prep the individual wires.
- Slide the 3" long piece of ½" dia. heat shrink P/N 450-113-00 and 4" long piece of ¼" dia. heat shrink P/N 450-120-00 over the cargo hook pigtail and a ½" long piece of heat shrink tubing P/N 450-001-00 over the two individual wires.
- Prep the wires on the Airbus Helicopters harness and solder the wires from the cargo hook pigtail to them, referring to the wiring diagram (see Figure 2.2.3).

Figure 2.2.1 Wiring Harness Modification



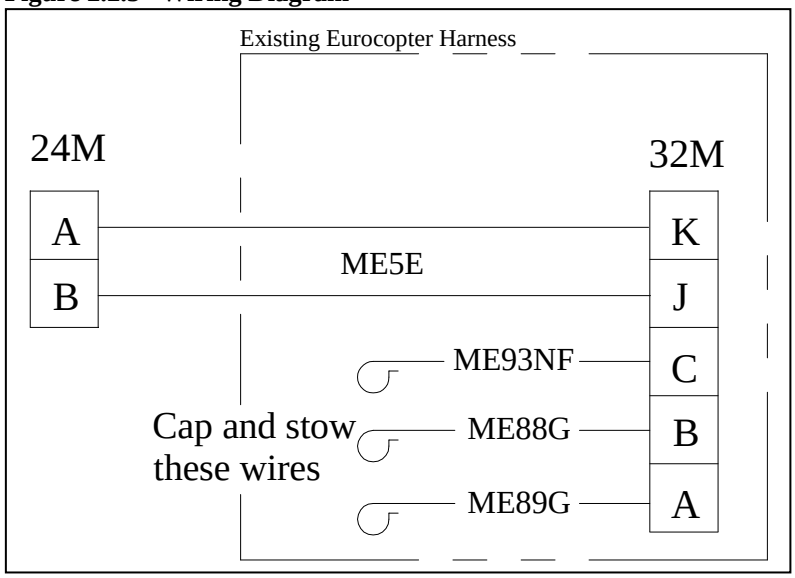
- Slide the heat shrink tubing over the individual solder joints and shrink in place using heat gun. Cap and stow the remaining three wires.
- Slide the 4" long piece of ¼" dia. heat shrink over the solder joints and shrink in place.
- Slide the 3" long piece of ½" dia. heat shrink over the convoluted tubing so that it overlaps it by approximately 1" and shrink in place.

Figure 2.2.2 Wiring Harness Modification - completed



2.2 Cargo Hook Installation

Figure 2.2.3 Wiring Diagram



CAUTION

The cargo hook is equipped with a suppression diode that will be damaged if the cargo hook electrical connections are reversed. See table 2.1 for cargo hook connector pin function.

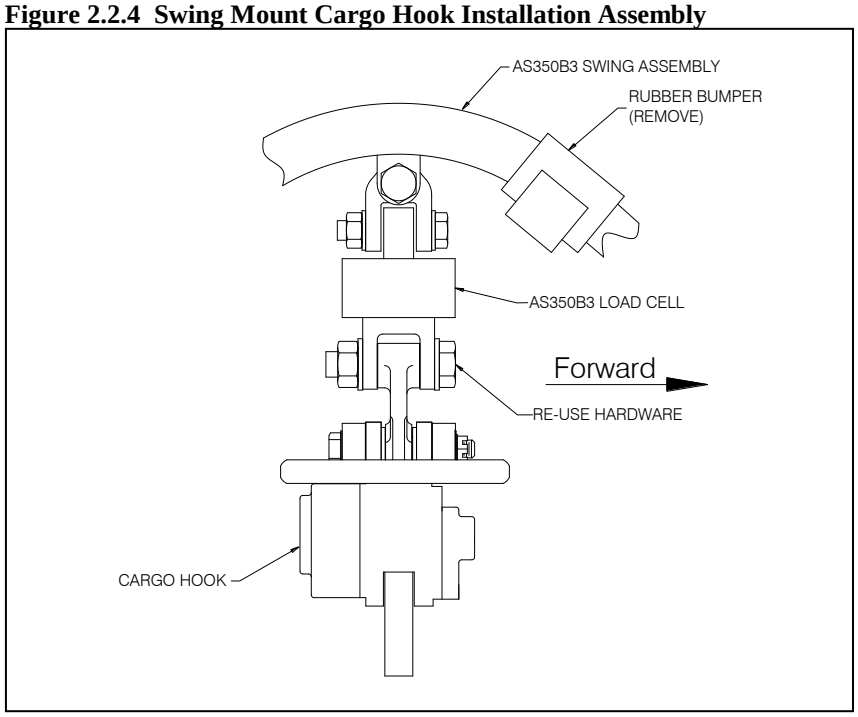
Table 2.1 Cargo Hook Connector

Pin	*Function*
A	Ground
B	Power

2.2 Cargo Hook Installation continued

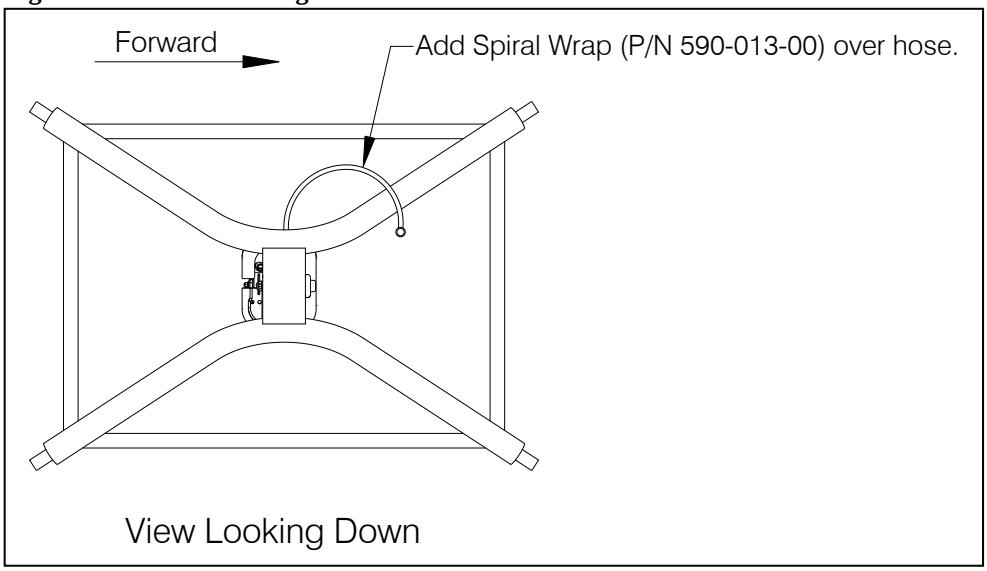
Attach the Cargo Hook and Bumper Assembly (P/N 232-222-00) to the existing load cell, re-using the Airbus Helicopters hardware (see below). The cargo hook load beam should point to the left side of the aircraft. Remove rubber bumpers from swing assembly.

Figure 2.2.4 Swing Mount Cargo Hook Installation Assembly



Route the hydraulic hose to the left, outside the swing frame tubes and up as shown below. Connect it to the fixed quick disconnect fitting installed previously. Install the supplied spiral wrap (P/N 590-013-00) over the hose and trim excess.

Figure 2.2.5 Hose Routing at Frame



2.3 Installation Check-Out

After installation of the cargo hook, perform the following checks.

1. Verify that the hydraulic hose routing does not have kinks and is clear of chafing points.
2. Ensure that the collective has full movement and is not restricted by the hydraulic hose routing.
3. Swing the installed cargo hook to ensure that the hydraulic hose assembly and the electrical release harness have enough slack to allow full swing of the suspension assembly without straining or damaging the hose or harness. The hose and harness must not be the stops that prevent the cargo hook from swinging freely in all directions.
4. With no load on the cargo hook load beam, pull the release lever on the collective and verify the cargo hook releases. Reset the cargo hook load beam.
5. With no load on the cargo hook load beam, depress the cargo hook electrical release button, the cargo hook must release. Reset the cargo hook load beam.
6. Actuate the release lever on the collective and observe its range of motion. Ensure that it is accessible and that there is no interference throughout its range of motion (refer to Figure 2.3.1). If necessary adjust the lever position by loosening the set screw and turning the lever adjustment screw (ref. Figure 2.3.2) in the required direction. Re-tighten set screw.

Figure 2.3.1 Lever Position

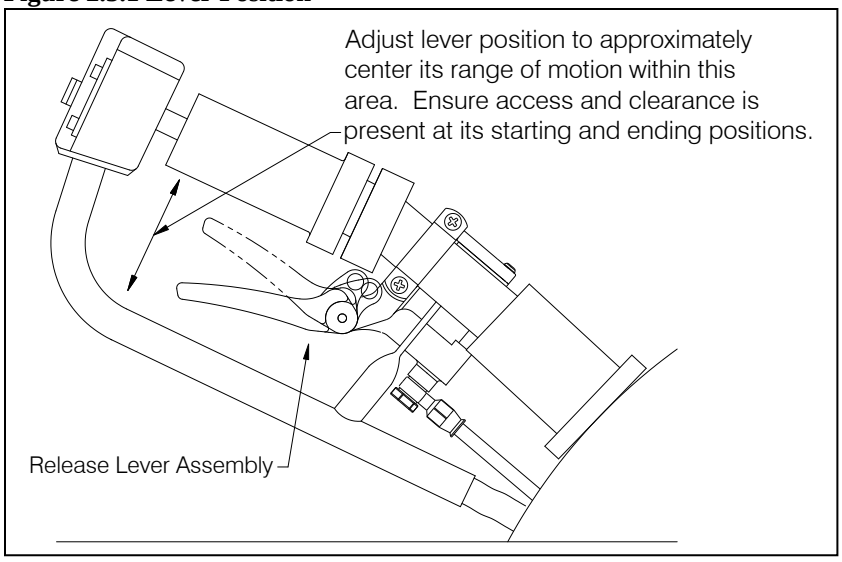
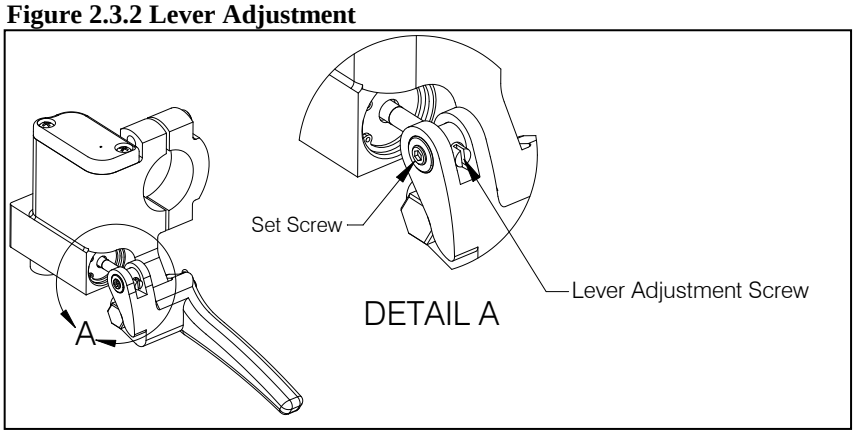

Adjust lever position to approximately center its range of motion within this area. Ensure access and clearance is present at its starting and ending positions.
Release Lever Assembly

Figure 2.3.2 Lever Adjustment



2.4 Component Weights

The weights and cgs of the Cargo Hook kit components are listed below. When performing weight and balance calculations remember to deduct equipment removed, such as manual release cable, etc.

Table 2.2 Weights and CGs – 200-281-01

Item	Weight	Station
Removable Provisions*	5.1 lbs (2.3 kgs)	133 in (3375 mm)
Fixed Provisions**	1.0 lb (.45 kgs)	110 in (2794 mm)
Total	6.1 lbs (2.8 kgs)	129.2 in (3282 mm)

Table 2.3 Weights and CGs – 200-281-02

Item	Weight	Station
Removable Provisions*	5.1 lbs (2.3 kgs)	133 in (3375 mm)
Fixed Provisions**	1.2 lb (.54 kgs)	110 in (2794 mm)
Total	6.3 lbs (2.9 kgs)	128.6 in (3266 mm)

***** The removable provisions include the hook, external hydraulic release hose, bumper, and electrical release harness. These items are easily removed if they are not needed on the helicopter's mission.

****** The fixed provisions are those items of the kit that remain on the aircraft. The only fixed item in this kit is the Master Cylinder with hydraulic hose.

2.5 Cargo Hook Location

See the Airbus Helicopters provided Flight Manual Supplement for external load weight and balance data.

2.6 Paper Work

In the US, fill in FAA form 337 for the initial installation. This procedure may vary in different countries. Make the appropriate aircraft log book entry. Insert the Rotorcraft Flight Manual Supplement P/N 121-014-01 into the Rotorcraft Flight Manual.

2.7 Filling Hydraulic Release System

Each hydraulic system is typically shipped dry. A label affixed to the Master Cylinder and Slave Cylinder assemblies will state if each hydraulic assembly has been filled and bled. Proper bleeding is critical to the operation of the hydraulic release system. An improperly bled system will not release the cargo hook mechanism.

A reservoir seal is installed beneath the reservoir lid. This seal serves to prevent hydraulic fluid left over from the testing process from leaking during shipping.

CAUTION

The reservoir seal is for shipping purposes only and must be removed and discarded before bleeding or installation of the hydraulic release system.

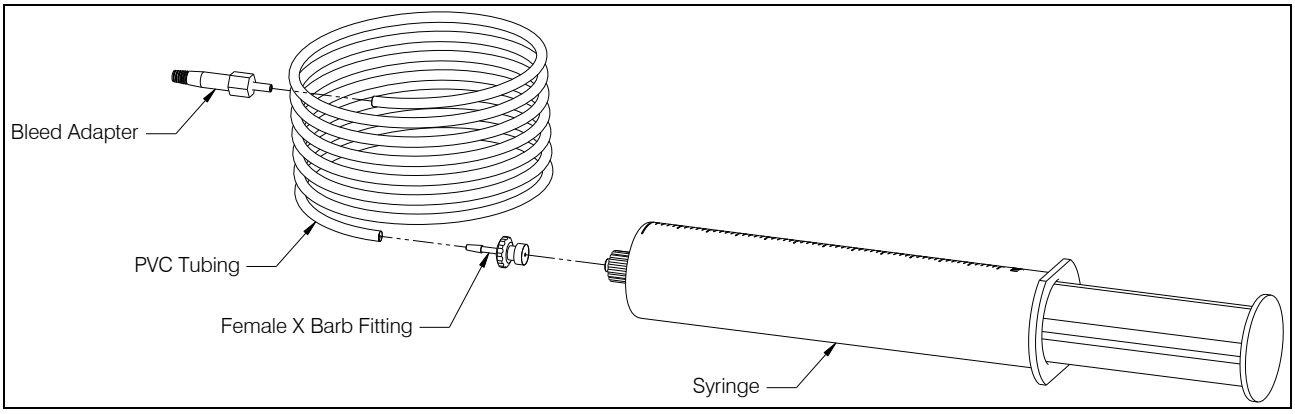
If there is a need to fill and/or bleed the system, follow the procedures listed below. If you need to remove and repair any items in the hydraulic system, refer to 123-013-01, Instruction for Continued Airworthiness.

Filling and bleeding the hydraulic release system is most easily accomplished on the bench, prior to installation on the aircraft. This process may also be accomplished after the system is installed. Filling and bleeding requires two persons, one to inject hydraulic fluid through the system and the other to observe the reservoir.

Bleeding procedure:

1. Obtain the hydraulic hook bleed kit, 212-014-01. This kit consists of 2 ounces of MIL-PRF-5606 fluid, a syringe, a female barb fitting, a length of PVC tubing, and a bleed adapter fitting. The bleed kit is included in new Hydraulic Hook kits. Assemble the bleed kit by press fitting each component as shown.

Figure 2.7.1 Hydraulic Hook Bleed Kit



2. If the system is already installed on the aircraft, place an absorbent towel under the master cylinder. If the master cylinder is not installed on the aircraft, lightly clamp the master cylinder in a vise to hold it in a vertical position and position the slave cylinder so that its level is below the level of the master cylinder.

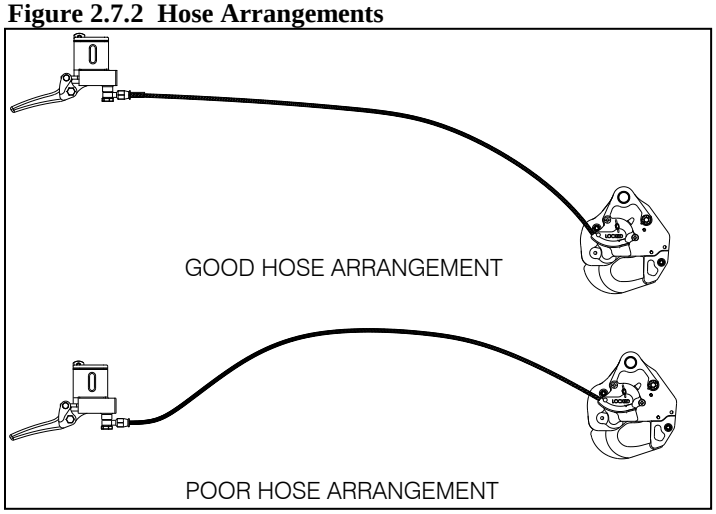
2.7 Filling Hydraulic Release System continued

NOTICE

Use best shop practices to keep foreign material out of the hydraulic system. FOD will plug orifices, damage seals and/or scratch sealing surfaces necessitating system rebuild. Use only clean hydraulic fluid from sealed containers.

3. Connect the master cylinder assembly to the slave cylinder assembly if not already done. If filling or bleeding on the bench, as much as possible, arrange the hoses uncoiled, straight and running uphill. See Figure 2.7.2.

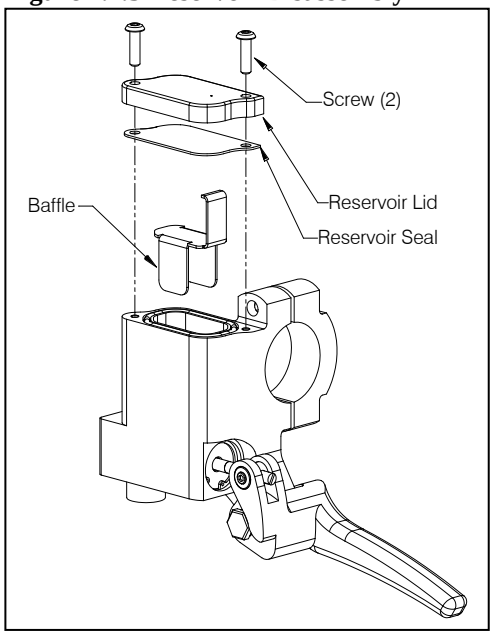
Figure 2.7.2 Hose Arrangements



4. Remove screws, reservoir lid, reservoir seal, and baffle from the master cylinder reservoir as shown in Figure 2.7.3 (the reservoir seal is supplied for shipping purposes only, after removal discard reservoir seal).

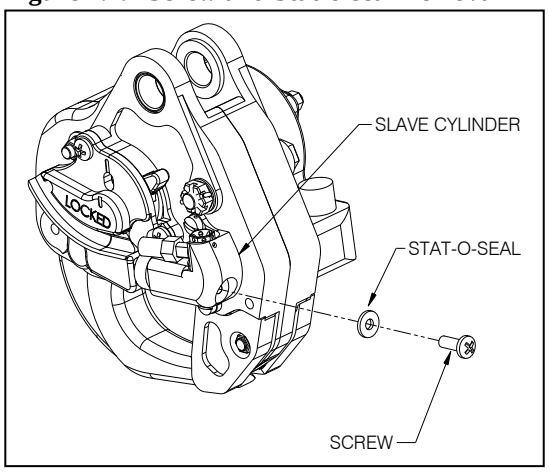
2.7 Filling Hydraulic Release System continued

Figure 2.7.3 Reservoir Disassembly



5. Remove the screw and stat-o-seal on the slave cylinder, see Figure 2.7.4.

Figure 2.7.4 Screw and Stat-o-seal Removal



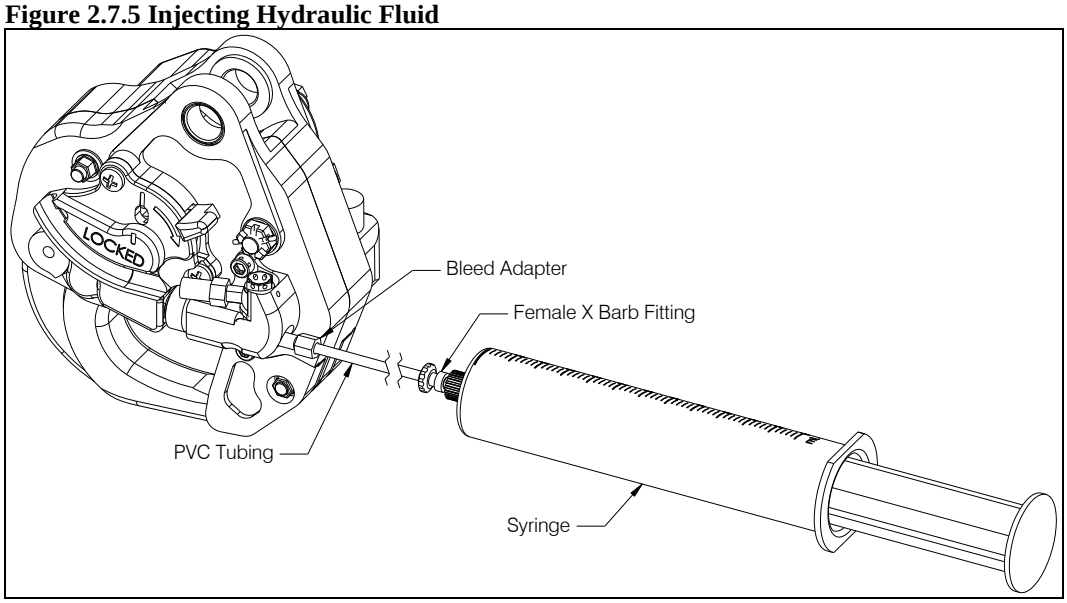
6. Fill the syringe with approximately 35 cc of MIL-PRF-5606 fluid and purge any remaining air in the syringe and tubing. Screw the end of the bleed adapter into the screw hole on the slave cylinder to create a tight seal. See Figure 2.7.5.
7. While observing the reservoir, **slowly** push on the syringe plunger to force fluid through the slave cylinder, hydraulic hose, and up to the master cylinder reservoir. There will be some resistance during filling—this is normal.

2.7 Filling Hydraulic Release System continued

CAUTION

Injecting the fluid into the system too rapidly may cause the fluid to spray up and out of the master cylinder reservoir. Wear safety glasses when observing fluid reservoir while filling.

Figure 2.7.5 Injecting Hydraulic Fluid



8. Continue to force fluid into the master cylinder reservoir until the reservoir is approximately half full.

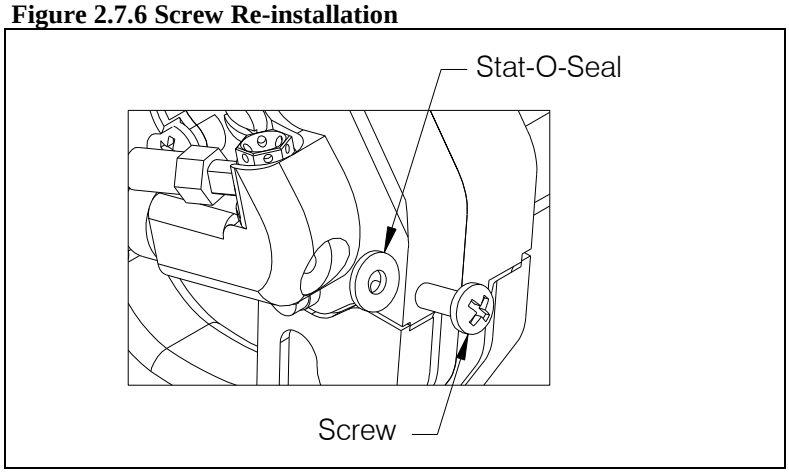
NOTICE

If bleeding an already filled system, you may need to draw fluid from the master cylinder reservoir during this step to prevent overflow.

9. Remove the bleed adapter from the screw hole. Re-install the Stat-O-Seal (P/N 510-496-00) and screw (P/N 510-493-00), see Figure 2.7.6.

2.7 Filling Hydraulic Release System continued

Figure 2.7.6 Screw Re-installation



10. Allow the system to rest for several minutes. This will allow any air to rise through the system.

11. Very slowly pull the release lever on the master cylinder and watch for bubbles. If bubbles are observed rising within the reservoir, continue to slowly cycle the lever until there are no more. Actuating the lever releases air trapped within the master cylinder.

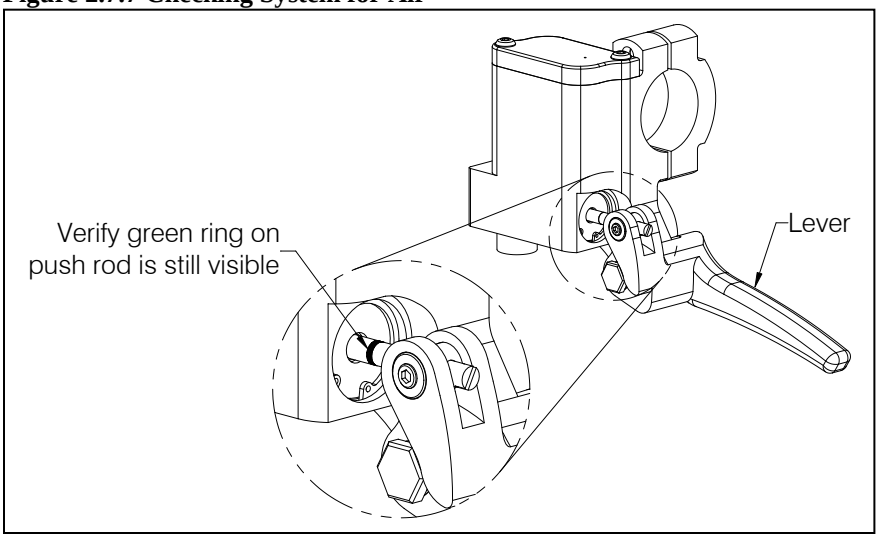
CAUTION

Pull the lever very slowly! When the reservoir is not baffled and capped, a hard pull will cause fluid to erupt over the edge of the reservoir.

2.7 Filling Hydraulic Release System continued

12. Check the system for air by actuating the lever firmly until it bottoms out. Check the push rod position (see Figure 2.7.7). If the green area on the push rod is visible, proceed to step 13. If the green on the push rod is not visible with the lever completely pulled, the system has too much air in it and needs further bleeding. To do this, repeat steps 5 – 11.

Figure 2.7.7 Checking System for Air



13. After the system is properly bled, verify that the reservoir is approximately half full of hydraulic fluid. Fluid should be visible above the baffle.
14. Re-install the baffle, and the reservoir lid.
15. Check the system for proper operation. Fully actuate the release lever. The hook must open and the lever must have a firm feel.
16. Disassemble and thoroughly clean the bleed kit with isopropyl alcohol. Allow it to dry. Not cleaning the kit will render it unusable. Reassemble and store for next use.

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Section 3
Operation Instructions
Operating Procedures

Prior to a flight involving external load operations perform the following.

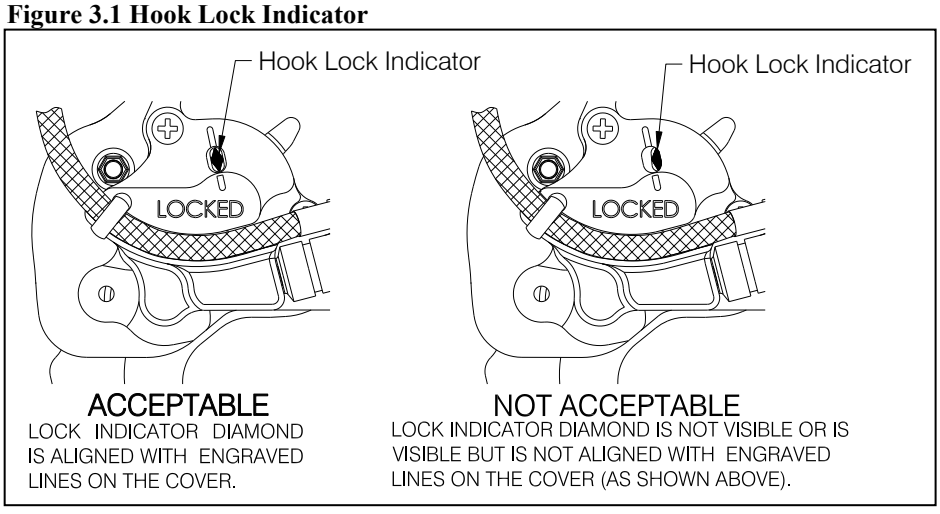
1. Ensure that the hydraulic hose and electrical release harnesses do not limit the movement of the cargo hook.
2. Be completely familiar with this manual, particularly the Cargo Hook rigging section.
3. Be completely familiar with all Airbus Helicopters Cargo Hook operating instructions and the ICA 123-013-01.
4. Activate the electrical system and press the cargo hook release button to ensure the cargo hook electrical release is operating correctly. The Cargo Hook must release. Reset the load beam by hand. If the hook does not release or re-latch, do not use the unit until the problem is resolved.

CAUTION

The release solenoid is intended to be energized only intermittently. Depressing the electrical release button continuously in excess of 20 seconds will cause the release solenoid to overheat, possibly causing permanent damage.

5. Activate the manual release lever in the cockpit to test the cargo hook manual release mechanism. The mechanism should operate smoothly and the Cargo Hook must release. Reset the load beam by hand. Verify that the hook lock indicator on the side of the hook returns to the fully locked position. In the fully locked position the hook lock indicator must align with the lines on the manual release cover (see Figure 3.1). If the hook does not release or re-latch, do not use the unit until the problem is resolved.

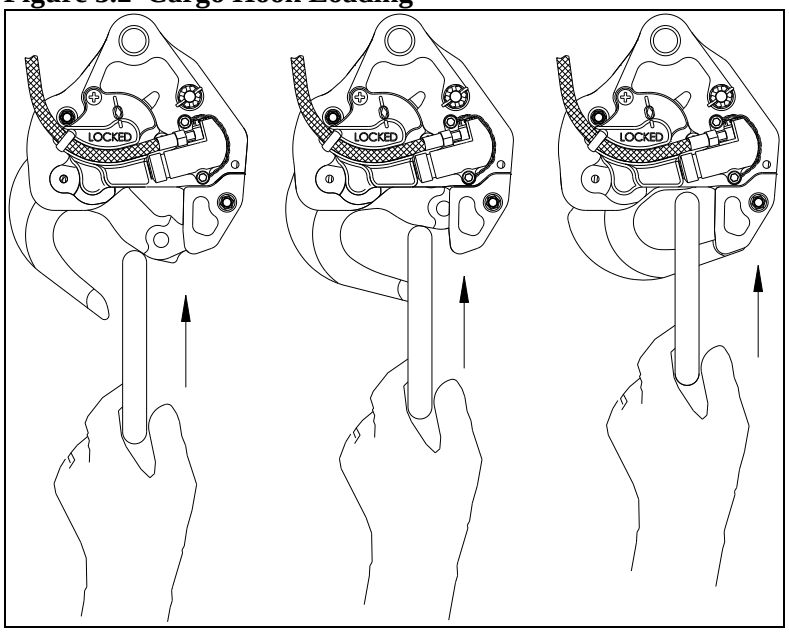
Figure 3.1 Hook Lock Indicator


Hook Lock Indicator
LOCKED
ACCEPTABLE
LOCK INDICATOR DIAMOND IS ALIGNED WITH ENGRAVED LINES ON THE COVER.
Hook Lock Indicator
LOCKED
NOT ACCEPTABLE
LOCK INDICATOR DIAMOND IS NOT VISIBLE OR IS VISIBLE BUT IS NOT ALIGNED WITH ENGRAVED LINES ON THE COVER (AS SHOWN ABOVE).

Cargo Hook Loading

The cargo hook can easily be loaded with one hand. A load is attached to the hook by pushing the ring upward against the upper portion of the load beam throat, as illustrated in Figure 3.2, until an internal latch engages the load beam and latches it in the closed position.

Figure 3.2 Cargo Hook Loading



Cargo Hook Rigging

Extreme care must be exercised when rigging a load to the Cargo Hook. Steel load rings are recommended to provide consistent release performance and resistance to fouling. Figure 3.3 shows the recommended rigging and rigging to avoid, but is NOT intended to represent all rigging possibilities.

⚠ CAUTION

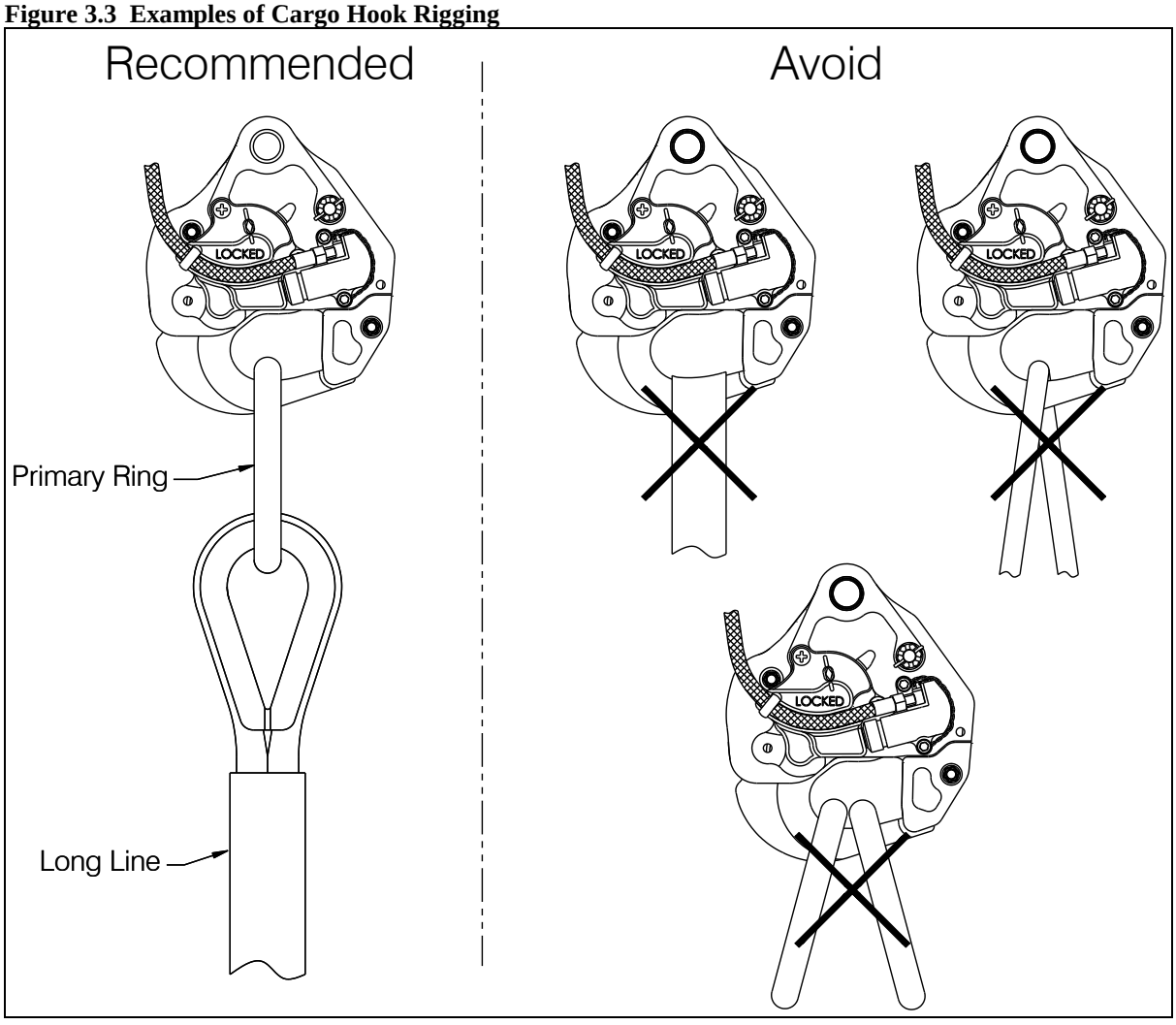
It is the responsibility of the operator to assure the cargo hook will function properly with each rigging.

⚠ CAUTION

Nylon type straps (or similar material) or rope must not be used directly on the cargo hook load beam. If nylon straps or rope must be used they should be first attached to a steel primary ring. Verify that the ring will freely slide off the load beam when it is opened. Only the primary ring should be in contact with the load beam.

Cargo Hook Rigging, continued

Figure 3.3 Examples of Cargo Hook Rigging



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Section 4
Maintenance

Refer to the Instructions for Continued Airworthiness (ICA) manual 123-013-01 for maintenance of the cargo hook kit. For maintenance specific to the cargo hook refer to Cargo Hook Service Manual 122-015-00.

Instructions for Returning Equipment to the Factory

If an Onboard Systems product must be returned to the factory for any reason (including returns, service, repairs, overhaul, etc) obtain an RMA number before shipping your return.

An RMA number is required for all equipment returns.

- To obtain an RMA, please use one of the listed methods.
  - Contact Technical Support by phone or e-mail (Techhelp@OnboardSystems.com).
  - Generate an RMA number at our website: http://www.onboardsystems.com/rma.php
- After you have obtained the RMA number, please be sure to:
  - Package the component carefully to ensure safe transit.
  - Write the RMA number on the outside of the box or on the mailing label.
  - Include the RMA number and reason for the return on your purchase or work order.
  - Include your name, address, phone and fax number and email (as applicable).
  - Return the components freight, cartage, insurance and customs prepaid to:

    Onboard Systems
    13915 NW 3rd Court
    Vancouver, Washington 98685
    USA
    Phone: 360-546-3072

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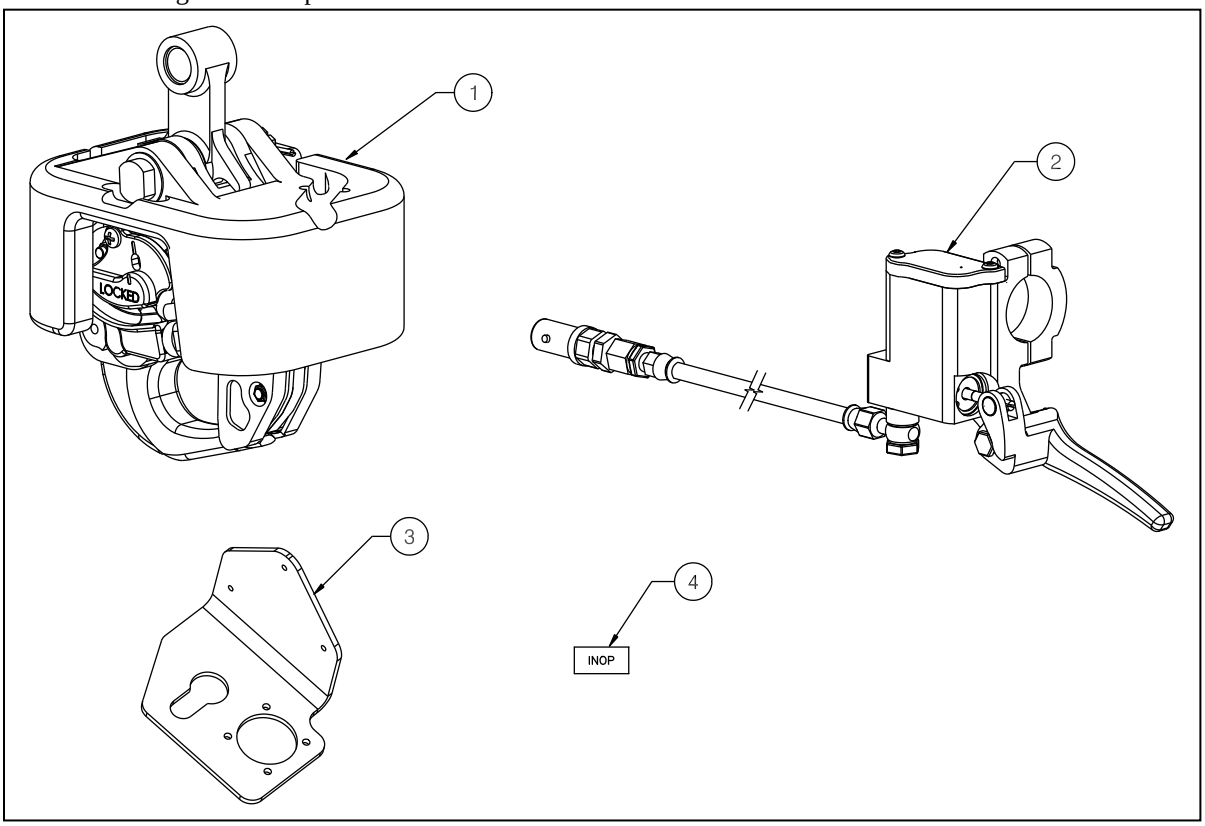
Section 5
System Part Numbers

200-281-01 Cargo Hook Replacement Kit

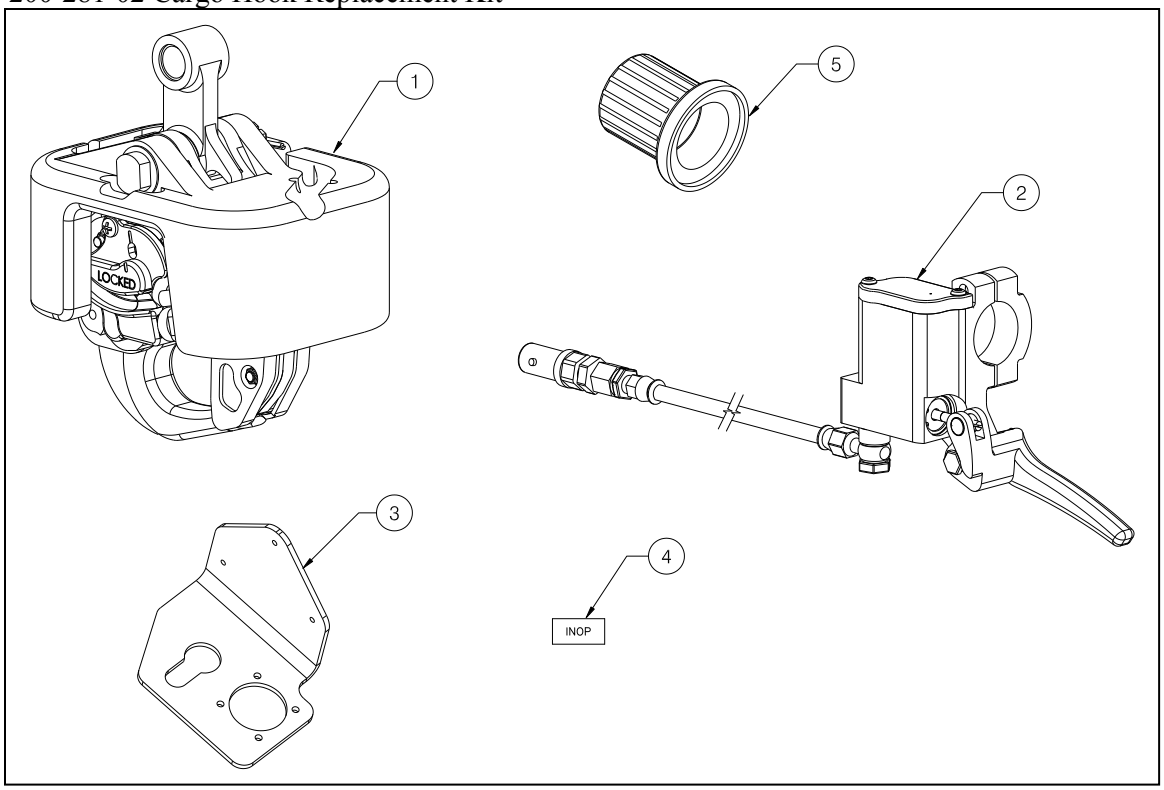


Item	Part No.	Description	Qty
1	232-222-00	Cargo Hook/Link Assembly	1
2	232-165-00	Master Cylinder Assembly	1
3	235-135-00	Disconnect Bracket	1
4	215-169-00	AS350 Light Indicator Placard	2
5*	510-453-00	Bolt	1
6*	510-042-00	Washer	1
7*	510-102-00	Nut	1
8*	512-005-00	Adel Clamp	1
9*	500-065-00	Grommet Edging	1
10*	505-014-00	Grommet	1
11*	450-001-00	1/8” Heat Shrink Tubing, 1” Lg.	2
12*	510-486-00	CherryMax Rivet	3

* Item not shown in Figure.

System Part Numbers continued

200-281-02 Cargo Hook Replacement Kit

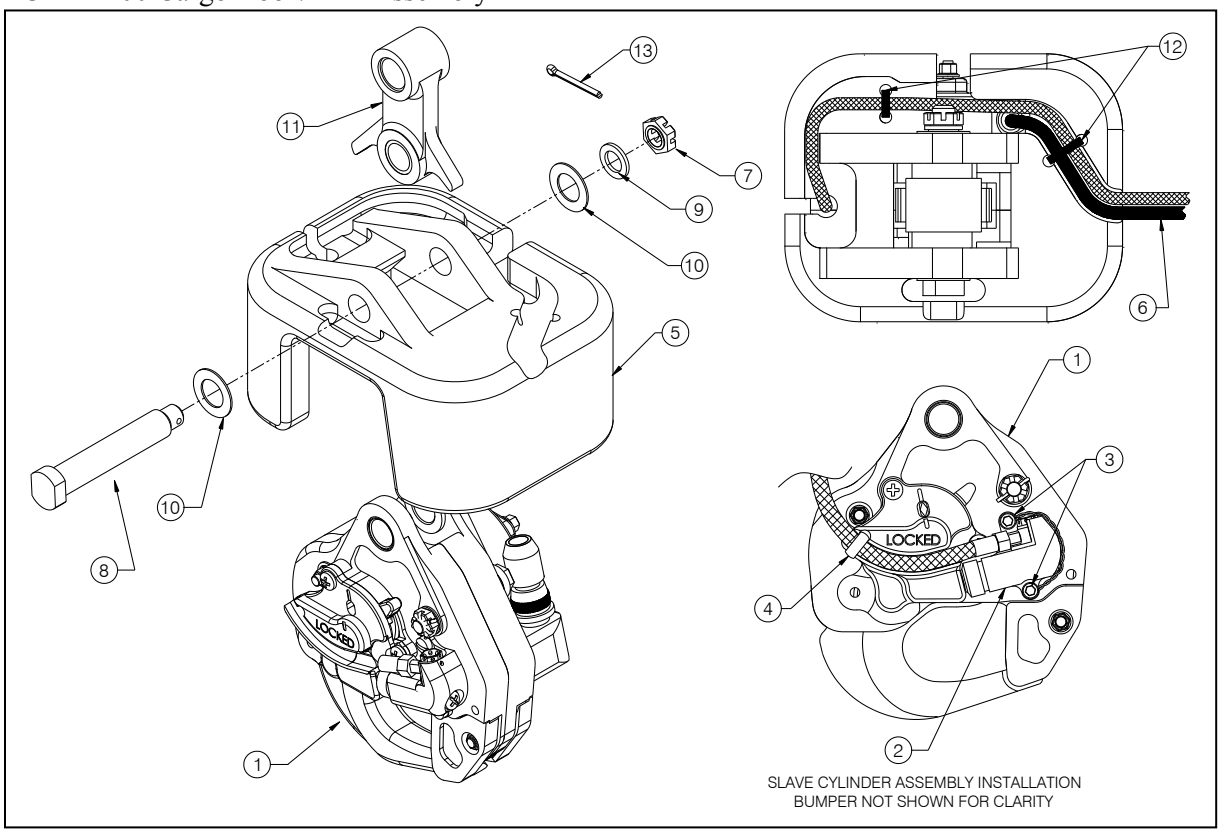


Item	Part No.	Description	Qty
1	232-222-00	Cargo Hook/Link Assembly	1
2	232-165-01	Master Cylinder Assembly	1
3	235-135-00	Disconnect Bracket	1
4	215-169-00	AS350 Light Indicator Placard	2
5	291-105-00	Friction Knob	1
6*	510-453-00	Bolt	1
7*	510-042-00	Washer	1
8*	510-102-00	Nut	1
9*	512-005-00	Adel Clamp	1
10*	500-065-00	Grommet Edging	1
11*	505-014-00	Grommet	1
12*	450-001-00	1/8” Heat Shrink Tubing, 1” Lg.	2
13*	510-486-00	CherryMax Rivet	3

* Item not shown in Figure.

System Part Numbers continued

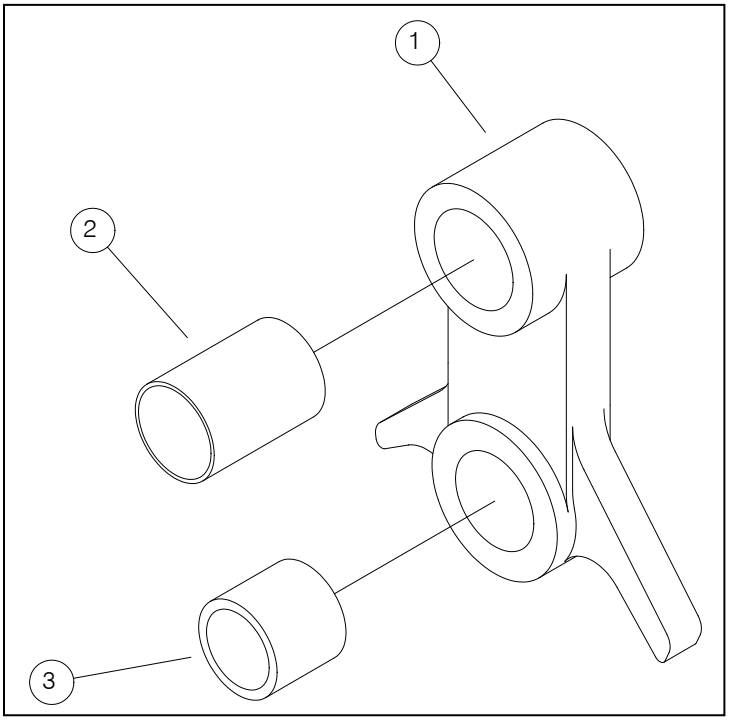
232-222-00 Cargo Hook/Link Assembly



Item	Part Number	Description	Qty
1	528-028-00	Cargo Hook	1
2	232-241-00	Slave Cylinder Assembly w/ Plumbing	1
3	510-531-00	Screw	2
4	512-003-00	Ty-wrap	1
5	290-940-00	Bumper	1
6	270-138-00	Electrical Release Harness	1
7	510-170-00	Nut	1
8	290-775-00	Attach Bolt	1
9	510-174-00	Washer	1
10	510-183-00	Washer	1
11	232-146-00	Link Assembly	1
12	512-011-00	Ty-wrap	2
13	510-178-00	Cotter Pin	1

System Part Numbers **continued**

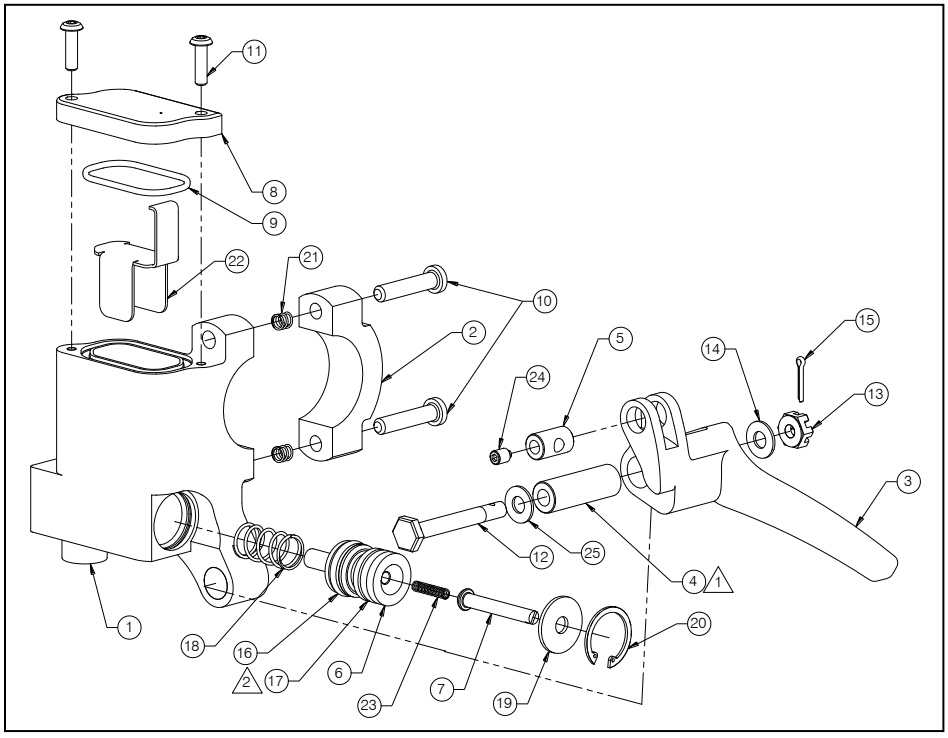
232-146-00 Link Assembly



Item	Part Number	Description	Qty
1	290-771-00	Adapter Link	1
2	517-052-00	Bushing	1
3	290-364-00	Bushing	1

System Part Numbers continued

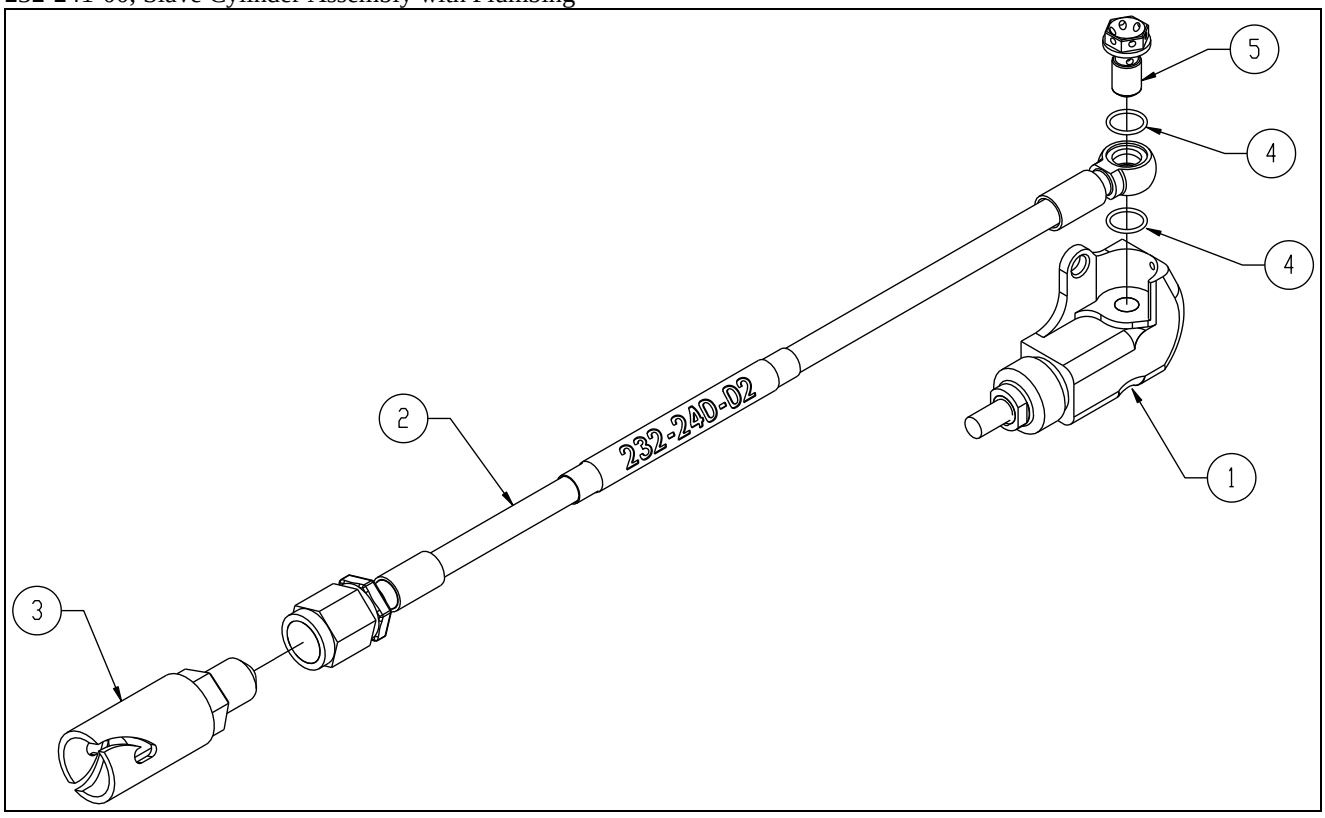
232-166-00, 232-166-01 Master Cylinder Assembly



ITEM	P/N	DESCRIPTION	QTY
1	290-810-01	Master Cylinder	1
2	290-753-00	Clamp Half	1
3	290-811-00**	Lever	1
4	290-816-00	Shaft	1
5	290-812-00	Barrel Nut	1
6	290-814-01	Piston	1
7	290-813-00	Push Rod	1
8	290-921-00	Reservoir Lid	1
9	556-044-00	O-Ring	1
10	510-390-00	Screw	2
11	510-157-00	#6-32 x ½" Button Head Cap Screw	2
12	510-487-00	Bolt	1
13	510-082-00	Nut	1
14	510-095-00	Washer	1
15	510-125-00	Cotter Pin	1
16	556-048-00	Cup Seal	1
17	556-047-00	O-Ring	1
18	514-055-00	Compression Spring	1
19	510-532-00	Washer – Piston Stop	1
20	515-008-00	Snap Ring	1
21	510-248-00	Helicoil	2
22	235-118-00	Master Cylinder Baffle	1
23	514-060-00	Compression Spring	1
24	510-530-00	#8-32 x 3/16" Nylon Tip Set Screw	1
25	510-042-00	Washer	1

**** 232-166-01 (included with kit P/N 200-281-02) uses lever P/N 290-811-01.**

232-241-00, Slave Cylinder Assembly with Plumbing

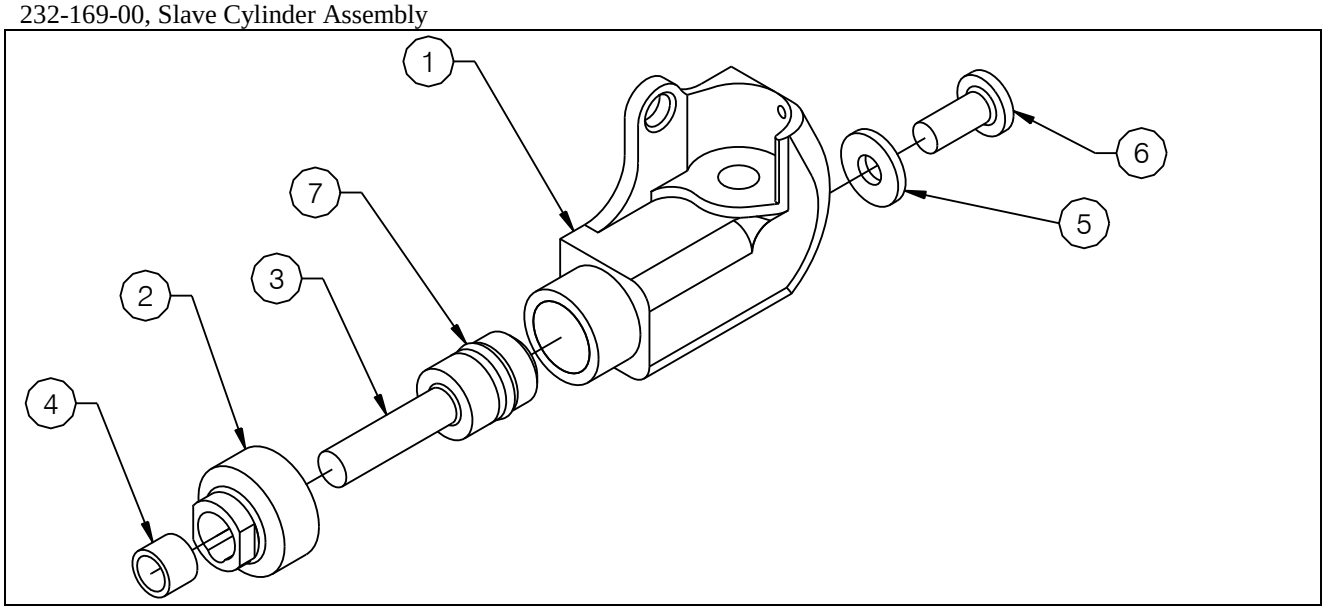


Item	Part Number	Description	Qty
1	232-169-00	Slave Cylinder Assembly	1
2	232-240-02[1]	Slave Cylinder Plumbing Assembly	1
3	560-006-00	Quick Disconnect	1
4	556-041-00	O-Ring	2
5	558-031-00	Banjo Bolt	1

[1]This item supersedes P/N 232-240-00 & 232-240-01. These assemblies are interchangeable.

System Part Numbers **continued**

232-169-00, Slave Cylinder Assembly



Item	Part Number	Description	Qty
1	290-803-00	Slave Cylinder	1
2	290-802-00	Cylinder Cap	1
3	290-805-00	Piston	1
4	517-040-00	Bushing	1
5	510-496-00	Stat-O-Seal	1
6	510-493-00	Screw	1
7	556-097-00	Quad Ring	1

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Section 6
Certification
FAA STC

United States of America
Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

Number **SR01166SE**

This certificate, issued to **Onboard Systems International**
13915 NW 3rd Court
Vancouver, WA 98685

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 27 *of the* Federal Aviation Regulations.

Original Product—Type Certificate Number: H9EU
Make: Eurocopter France
Model: AS350B, AS350B1, AS350B2, AS350B3, AS350BA, & AS350D

Description of the Type Design Change: Fabrication of Onboard Systems Model 200-281-00, 200-281-01, and 200-281-02 Cargo Hook Kits in accordance with FAA approved Onboard Systems Master Drawing List No. 155-088-00, Revision 8, dated October 26, 2007, or later FAA approved revision.

Installation of the 200-281-00 cargo hook kit in accordance with FAA approved Onboard Systems Owner's Manual No. 120-106-00, revision 6, dated July 1, 2005, or later FAA approved revision. This modification must be inspected and maintained in accordance with Section ATA 5 of the FAA approved Onboard Systems Instructions for Continued Airworthiness Document No. 123-013-00, revision 3, dated July 1, 2005, or later FAA approved revision and Onboard Systems Cargo Hook Service Manual No. 122-005-00, revision 9, dated January 3, 2006, or later FAA approved revision. (continued on page 3)

Limitations and Conditions: Approval of this change in type design applies only to those Eurocopter AS350 model rotorcraft listed above that are equipped with the Eurocopter 1400kg Cargo Swing System as installed per Eurocopter Service Bulletin 25.00.62. This approval should not be extended to other rotorcraft of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that rotorcraft. Rotorcraft modified in accordance with this STC with a 200-281-00 cargo hook kit must be operated in accordance with an FAA approved copy of Onboard Rotorcraft Flight Manual Supplement (RFMS) No. 121-014-00, revision 0, dated January 15, 2003, or later FAA approved revision. A copy of this Certificate, FAA approved RFMS, and Maintenance Manual must be maintained as part of the permanent records of the modified rotorcraft. (continued on page 3)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 15, 2002 *Date reissued:*
Date of issuance: January 22, 2003 *Date amended:* December 21, 2007

By direction of the Administrator

(Signature)
Acting Manager, Seattle Aircraft Certification Office, ANM-100S
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA FORM 8110-2(10-68)

United States of America
Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number **SR01166SE**

Onboard Systems International
Reissued:
Amended: December 21, 2007

Description of the Type Design Change:

Installation of the 200-281-01 and 200-281-02 cargo hook kits in accordance with FAA approved Onboard Systems Owner's Manual No. 120-106-01, revision 0, dated June 16, 2006, or later FAA approved revision. This modification must be inspected and maintained in accordance with Section ATA 5 of the FAA approved Onboard Systems Instructions for Continued Airworthiness Document No. 123-013-01, revision 1, dated October 25, 2007, or later FAA approved revision and Onboard Systems Cargo Hook Service Manual No. 122-015-00, revision 4, dated July 6, 2006, or later FAA approved revision.

Limitations and Conditions: (cont'd)

Rotorcraft modified in accordance with this STC with a 200-281-01 or 200-281-02 cargo hook kit must be operated in accordance with an FAA approved copy of Onboard Systems Rotorcraft Flight Manual Supplement (RFMS) No. 121-014-01, revision 0, dated December 13, 2007, or later FAA approved revision. A copy of this certificate, FAA approved RFMS, Owner's Manual, and Service Manual must be maintained as part of the permanent records of the modified rotorcraft. A copy of this Certificate, FAA approved RFMS, and Maintenance Manual must be maintained as part of the permanent records of the modified rotorcraft.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

- END -

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2-1 (10-69) *This certificate may be transferred in accordance with FAR 21.47.*

PAGE 3 OF 3 PAGES

Canadian Approval

Transport Canada / Transports Canada
Aviation / Aviation

Aircraft Certification Branch
620 - 800 Burrard Street
Vancouver, BC V6Z 2J8

Your file *Votre référence*
190S-03-169
Our file *Notre référence*

March 24, 2003

Onboard Systems
13915 NW 3rd Court
Vancouver, WA 98685
USA

Attention: Mr. Ron Pirtle

Subject: Acceptance of Foreign STCs SR01164SE, SR01165SE, and SR01166SE

Dear Sir:

This is in response to your letters dated February 25, 2003 making application for Canadian approvals of the subject STCs.

In accordance with our current policy associated with the review of foreign STCs, some STCs applicable to certain categories of rotorcraft may be accepted solely on the basis of their foreign certification, and do not require the issue of a corresponding certificate by Transport Canada. The subject STCs fall within these criteria.

These STCs will be entered in the national index of STCs that have been reviewed and accepted by Transport Canada for installation on Canadian-registered aeronautical products.

This letter confirms formal acceptance of the referenced STCs by Transport Canada. Should you require additional information with regards to this matter or clarification please do not hesitate to contact the undersigned at (604) 666-5597.

Yours truly,

H. W. Wong
Senior Engineer, Aircraft Certification

for
Minister of Transport

c.c. Mr. Jeffrey E. Duven
Acting Manager, Seattle ACO

Canada

1/1

EASA STC

European Aviation Safety Agency

SUPPLEMENTAL TYPE CERTIFICATE

EASA.IM.R.S.00623

This certificate, established in accordance with Regulations (EC) No 1592/2002 and (EC) No 1702/2003 and issued to:

Onboard Systems
13915 NW 3rd Court
Vancouver, WA 98685
USA

certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable type certification basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Product Type Certificate number: *DGAC TC No. 84*
Manufacturer: *Eurocopter France*
Model: *Eurocopter AS 350 B3 Helicopter*

Description of Design Change:

Cargo Hook Kit installation, in accordance with FAA STC No. SR1166SE issued January 22, 2003.

EASA STC continued

European Aviation Safety Agency

Associated Technical Documentation:

- AS 350 B3 Flight Manual and RFM Supplement Onboard No. 121-014-00 dated January 15, 2003, and revised on July 23, 2004 or later approved revisions.

Limitations and Conditions:

1. This STC is approved only for the product configuration as defined in the approved design data referred to in the paragraph "Description". Compatibility with other aircraft/engine configurations shall be determined by the installer.

This certificate shall remain valid unless otherwise surrendered or revoked.

For the European Aviation Safety Agency,
Date of Issue: 15th March 2005

M. Mazzoletti
Certification Manager
Rotorcraft, Ballons and Airships

STC- EASA.IM.R.S.00623 - Onboard Systems

2